

Collocated photo sharing, story-telling, and the performance of self

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Abstract

This article reports empirical findings from four inter-related studies, with an emphasis on collocated sharing. Collocated sharing remains important, using both traditional and emerging image-related technologies. Co-present viewing is a dynamic, improvisational construction of a contingent, situated interaction between story-teller and audience. The concept of performance, as articulated differently by Erving Goffman and Judith Butler, is useful understand the enduring importance of co-present sharing of photos and the importance of oral narratives around images in enacting identity and relationships. Finally, we suggest some implications for both HCI research and the design of image-related technologies.

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1. Introduction

One of the most successful consumer technologies of the twentieth century was the film camera. Recent years have seen massive changes in personal photography, including the transition from film to digital; the introduction of small, high-quality digital cameras, and cameraphones; and easy display and sharing of digital images, not only with intimates but posted online to the world at large.¹

This paper is primarily concerned with collocated sharing, specifically of personal photos, that is, images made by non-professionals, for themselves and intimates, acquaintances, and even strangers. While computer networking has enabled great advances in photo sharing at a distance, collocated sharing remains important. And, I argue in this article, will remain so.

The approach taken here is rooted largely in science and technology studies (STS). STS approaches technologies as sociotechnical systems: heterogeneous networks of culturally and historically situated artifacts, technologies, practices, people, and understandings. Technology “design” is a

process of heterogeneous engineering of these components (Law, 2001), and not necessarily by designers. Meanings are created by users as they match the possibilities of the technology to their ongoing and emerging goals, experiences, and activities. An artifact’s design constrains these interpretations, especially over the short term. But, as Suchman et al. (2002) put it:

Technologies appear in these investigations as socio-material apparatuses that align themselves into more and less coherent and durable forms...in ongoing practices of assembly, demonstration, and performance. The shift from an analysis in terms of form and function to a performative account, moreover, carries with it an orientation to the multiplicity of technoscience objects. (Suchman et al., 2002; pp. 163–164).

To design useful photo-related, image-related technologies, we need to understand personal photography as an enduring but malleable assemblage of technologies, practices, intentions, and understandings embedded in people’s daily lives. We need to support both on-going and emerging photographic practices. Most of all, we must not “break” a technology that is so widely used and loved, but, if possible, enhance users’ experience.

This article reports empirical findings from four inter-related studies, with an emphasis on collocated sharing.

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¹Industry sources estimate that 120 million digital cameras were shipped worldwide in 2008, a 20% increase over 2007. The projected figure for 2009 is 119 million (Camera and Imaging Products Association, 2009).

We found that collocated sharing remains important in a digitally-mediated, distributed world. Both traditional and emerging image-related technologies are being used in collocated sharing. Co-present viewing is a dynamic, improvisational construction of a contingent, situated interaction between story-teller and audience.

In asking *why* collocated sharing is practiced regularly and whether it will continue to be, in a networked, distributed world, I argue that the concept of performance, as articulated in somewhat different ways by Erving Goffman and Judith Butler, can help us to understand the co-present sharing of photos and its role in enacting identity and relationships. Finally, I suggest some implications for both HCI research and the design of image-related technologies.

2. Related research

Research on personal photography and its associated practices is spread across several fields, including visual sociology, visual anthropology, and visual studies, as well as HCI. The existing empirical research, however, must be treated with caution. Personal photography is a culturally and socially situated activity. For example, Bourdieu and Bourdieu (2004) say of the French peasants in the 1960s that hanging family photos in the more public parts of house, a common practice among our participants, would be “ostentatious” (p. 606). Furthermore, photographic practice is inevitable entangled with technology, which changes over time. When Musello (1980) notes that he saw many family photos taken out of doors, we have to remember that until the 1980s flashbulbs were single-use and expensive. We need to be careful about generalizing beyond specific studies.

While some within media studies are thinking about the significance of digital images (e.g., Dijck, 2007), empirical research within visual sociology and related areas has lagged. The research that has been done has focused overwhelmingly on family photography (pictures of and for family members and other intimates) and the role of photos in the home (Bouquet, 2000; Chalfen, 1987; Holland, 1991, 1997; Rose, 2003, 2004; Shove et al., 2007; Spence and Holland, 1991), and, to a lesser extent, tourist photography (Haldrup and Larsen, 2003; Larsen, 2005). Yet even a casual perusal of a public photo-sharing site such as Flickr.com shows many other kinds of images are made by non-professionals.

This emphasis on family and tourist photography is a function of both the focus and the methods of previous research. In the world of photographic print, to see private photos the researcher had to go into the home to view images archived and displayed (Chalfen, 1987; Rose, 2003) or analyze photo albums (Walker and Moulton, 1989). Each of these contains a highly selected minority of the images actually made, likely biased toward family and travel photos. Much contemporary sociological research on personal photography is concerned with its role in

construction of the family and domestic space; the material culture of the home; household consumption; and leisure activity (Holland, 1991; Rose, 2003, 2004; Shove et al., 2007; Slater, 1995). These topics reinforce the emphasis on family and tourist photography.

Researchers in the social sciences note that there has been surprisingly little research on the ordinary, everyday practices of personal photography (Chalfen, 1998; Rose, 2004; Ruby, 2005). One recent exception is Shove et al. (2007). As part of a larger study of material objects and their practices, they investigated digital photography. Their work is rooted in sociology of consumption, design research, studies of material culture, and (like this article) science and technology studies. They wanted to bridge some of the gaps among these fields in understanding material objects in everyday life and social practice.

With consumer adoption of digital photography, HCI has become interested in the design of technologies for image storage, organization, display, and sharing (both face-to-face and distant). We need to distinguish between experimental, quasi-experimental, or interventionist research, and naturalistic observations of naturally-occurring practices. The former introduces technology, often in prototype, sometimes with additional interventions to jump-start use; the later observes people’s naturally-motivated real-life activities.

HCI researchers have used ethnographically-informed methods to get at users’ existing goals and practices with personal photos, often, but not always, in support of a design project. Frohlich et al. (2002) asked people to record their photo-related activity around digital and conventional photos, including conversations, to develop requirements for photo-sharing technologies, or “photoware.” Crabtree et al. (2004) elaborated on this work for sharing at a distance. Rodden and Wood (2003) studied early digital photographers to ask how they managed their collections.

Images are frequently shared, in a variety of ways. Several projects have sought to design systems to support “social presence” or “affective awareness” – synchronous awareness of distant others – using images (Counts and Fellheimer, 2004; Mynatt et al., 2001; Romero et al., 2007). New technologies for collocated image viewing are being developed and tested, such as tabletop displays (Apted et al., 2006) and collocated-synchronous sharing across cameraphones among a collocated group (Clawson et al., 2008).

Taylor et al. (2007) studied home photo displays via visits, interviews, and participant-generated video, and then made suggestions for the design of displays in the home. They were interested in the obligations and meanings of home displays of photos, the distribution and coordination of the work around photos within a household, and “curatorial control,” the decisions made about what is displayed where and how. In visual studies, Rose (2003, 2004) also studied home photo displays. She interviewed a set of mother who exercised curatorial

control over family photos. Her primary topic is the production and extension of domestic space beyond the home and the enactment of “togetherness” by means of the display of family photos and family practices with and around photos.

Online sharing of images is generating interest in both HCI and visual studies. Pauwels (2008) studied 400 family websites to discuss both the nature of such sites and their implications as sources of researchers data. He noted that the publicness of such sites – among distributed family members as well as the extended audience on the web – has changed the nature of family communication and the social and cultural functions of “this highly codified practice” (p. 34) of family image collections.

Flickr.com is a publicly-accessible site for personal photos. The size and analyzability of the Flickr.com database has led to large-scale statistical studies of social networking and viewing patterns. Mislove et al. (2008), for example, found that 50 percent of Flickr photoviews took place within two days of uploading; photos also discovered quickly but have a short period of interest.

Qualitative research on Flickr includes tagging (keywording) practices (Ames and Naaman, 2007) among US users. Miller and Edwards (2007) in a small study of US Flickr users, identified two kinds of Flickr users. One group used it primarily to share family photos. They had no interest in tagging and were concerned about privacy. The other shared images more freely and them tagged for the benefit of unknown other photographers. Flickr’s design was more satisfactory for the latter than the former.

In recent years, cameraphones have proliferated,² and become an important photographic technology and a subject of research. Koskinen et al. (2002) looked at the sharing of images via MMS in Finland. Sarvas et al. (2005) looked at the kind of discourse that took place around cameraphone photos shared via a network server in Finland. Kindberg et al. (2005), in a study of US and UK users, described cameraphone images along three dimensions: affective versus functional; social versus individual; and for use with co-present or remote others. Two thirds of the images were for sharing, mostly for affective reasons, and most sharing was face to face, on the phone.

Okabe and Ito (2006) conducted a combined interview and diary study of 15 college student cameraphone users in Japan in 2003. They conclude that, among their subjects, cameraphone images were taken primarily for a personal visual archive, not shared. Network-based sharing of images was seen as more intrusive than mobile email and potentially narcissistic. When images were shared, they were shared on the device. When they were sent to others, it was only to a handful of intimates. Okabe and Ito conclude

that this pattern of activity grew out of established practices of voice and email mobile communication in Japan. In contrast, Hjorth (2007) found that among college students in Korea, most cameraphone images were taken for sharing, primarily via “mini-hompy,” community-based mini-homepages. The emphasis, she concludes, is less on content than on sharing. The differences between these two Asian cameraphone studies warn us about the dangers of generalizing the findings of what seem to be similar studies in different from places and times.

A few studies have combined cameraphones with online sharing. Zonetag and Zurfer are two related cameraphone applications from Yahoo! (Yahoo.com), the owner of Flickr.com. Zonetag supports the uploading of pictures directly from the cameraphone to Flickr. Ames et al. (2009) studied Zonetag users, as we will discuss more below. Ahern et al. (2007) investigated Zonetag users’ privacy concerns.

Zurfer is a phone-based application allows users to view their own Flickr images plus selected others on their cameraphone. Naaman et al. (2008) interviewed a small group of nine Zurfer users and concluded that co-present image sharing was one of its major uses. They categorized co-present viewing as story-telling; identity-presentation; and social information sharing.

There are two important caveats to interpreting the findings from these studies. One is the highly culturally and socially situated nature of personal photography, as we noted in comparing Okabe and Ito’s work to Hjorth’s. The other is the dependence of practice on current technologies. For example, in Van House et al. (2005) we found that most participants encountered technical difficulties or uncertainties about cost when sharing from phone to phone. This may account in part for the large number of images shared on the handset by Okabe and Ito (2006) and Kindberg et al. (2005).

In earlier work related to the present study, Van House et al. (2004) identified four social uses of personal photographs: personal and group memory, relationship creating and maintenance, self-presentation, and self-expression. Van House et al. (2005) studied 60 users of the MMM2 system. We gave cameraphones to participants along with access to a web-based system for uploading images from the phone automatically. We found that these same four social uses recurred, but with different specifics. In a study of Zonetag related to the current study, Ames et al. (2009) gave cameraphones, Zonetag, and Flickr to 26 users for 3–5 months. Participants appreciated the convenience of automatic uploading. However, sharing images face-to-face on the phone was also a popular activity.

3. The present study

This paper draws on findings from four related interview-based investigations into personal photography, part of our larger on-going research program about social

²Current statistics are hard to find, because much of the research is proprietary marketing research. However, some indicative figures: In January, 2008, 22% of US and 28% of European mobile subscribers sent or received photos or videos. (M:Metrics, 2006).

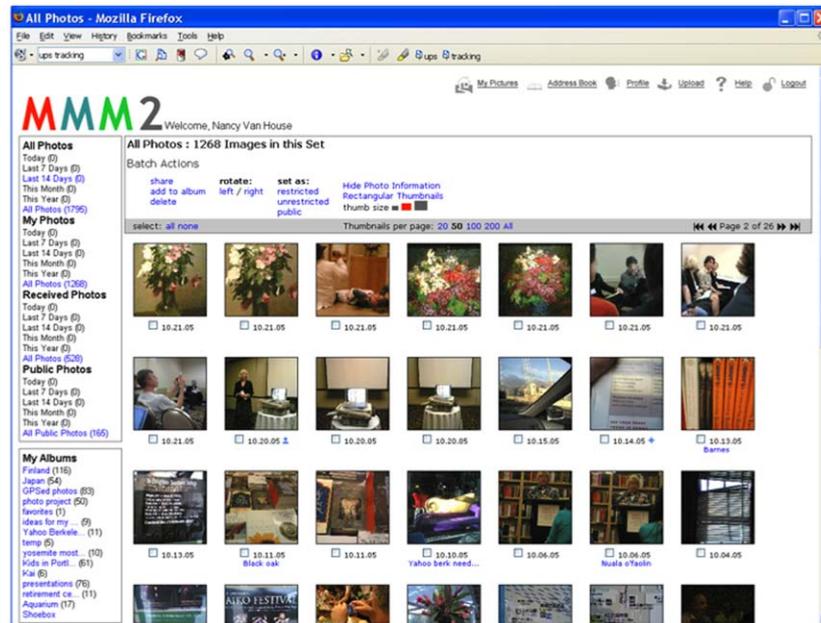


Fig. 1. MMM2 user personal webpage. Shows images taken by the owner or received from other MMM2 users, by time, most recent first. From here images can be sent to other users on the MMM2 to system or, via email, to others.

media, personal photography, and new media (Davis et al., 2005; Van House, 2004, 2006a, 2006b, 2007; Van House et al., 2005; Ames et al., 2009). In addition, this author and various co-researchers over about 5 years were participant observers and engaged in less formal observation of photographic practices.

3.1. Participants

The first group of interviewees were middle-class US photographers, film and digital, not using any particular technology. We used these interviews, along with an extensive literature review, as a kind of baseline for understanding emerging photographic technologies. These interviews took place primarily in 2004 and 2005 but have continued to the present. Their images ranged from snapshots of friends, family, and vacations, to high quality art photography. Some early interviewees were still using film or just beginning to use digital cameras. Our more serious photographers were slow to shift to digital. They had concerns about the image quality with early digital cameras, and already had a considerable investment in film equipment and expertise.

The second group were primarily graduate students in the School of Information Management and Systems (now the School of Information) at the University of California, Berkeley. The goal of the study was to test a new application, MMM2; and to give a tightly-connected group uniform technology, remove cost barriers, and support easy uploading and sharing, and then investigate how (and whether) they would incorporate cameraphones and internet-based image sharing into their daily lives.

They were given Nokia 7610 cameraphones and service plans in conjunction with the development of an experimental

system, MMM2 (Davis et al., 2005; Van House et al., 2005). MMM2 automatically uploaded cameraphone images to the photographer's private web space immediately after capture (Fig. 1). From there, photographers could send specific images to other people's email, and, for MMM2 recipients, to their MMM2 website. Each photo also had its own URL that could be sent to viewers.

Most of these graduate students were returning to school after several years in the workforce. Their average age was about 30, and 62 percent were female. They were closely interconnected both in their schoolwork and socially, and engaged in frequent interaction face-to-face and via a variety of communication technologies.

The cameraphones were deployed during academic year 2004–2005, before Facebook, Flickr, Twitter, and other social networking technologies became common. Most participants used the phones and MMM2 for 5 months; a few up to 10 months. Their cameraphone images tended to be casual photos of friends, parties, fellow-students at school, as well as humorous or interesting random sights. One parent in the group took many cameraphone images of his children.

The third group were 16 Flickr.com users identified through the research team's social groups and a query on the SIMS alumni list asking people to recommend friends and colleagues. Flickr³ is a free (or low cost for premium users) online image sharing sites. Each member has his or her photo "stream," images arranged in order of uploading. Images may include titles, captions, tags or keywords, and comments by viewers. What is most notable about

³As of November, 2008, Flickr was estimated to contained 3 billion images, <http://www.techcrunch.com/2008/11/03/three-billion-photos-at-flickr/>.

Flickr is its publicness: while images can be made private, most participants made their images viewable by anyone. Flickr is designed to make it easy to follow the activity of other members whom one designates as contacts. These participants were interviewed between 2005 and 2007.

Some of the younger Flickr users had never used film cameras. Many had cameraphones, and some used applications to upload and/or share images. Most but not all were undergraduate or (predominately) graduate students at the University of California, Berkeley, ranging in age from about 20–40. The remaining participants were non-students, in their 30s and 40s, whom we found through our social networks. In addition to these 16, we re-interviewed nine members the MMM2 group, now working in the information industry, who had joined Flickr on their own after the end of the MMM project. Their pictures ranged from casual images of friends and parties to more serious art photography. Some were also using Facebook or MySpace.

The fourth group were 18 participants in a related study (Ames et al., 2009), selected through other researchers' social groups and referrals. None were students. Participants were chosen in clusters: co-workers, friends, and parents whose children attended the same pre-school. The goal was to select groups who were already socially-connected and give them cameraphones and related applications for sharing images. These were given Nokia N-95 cameraphones, equipped with Zonetag (<http://zonetag.research.yahoo.com/>), which facilitated uploading from the phone to Flickr; and free voice and data service. Five had joined Flickr previously on their own while the other 13 were given new Flickr accounts. The project ran for about 5 months in 2007.

These people's images tended to be snapshots of children, friends, travel, humor, and interesting scenes and events. Some also engaged in more serious photography with high-quality cameras; several were graphic artists. None used Facebook or related social networking sites; some described themselves as "anti-Facebook," mystified by why people would want to spend the time or make their lives that open. A woman of about 30 said Facebook was for a younger crowd.

In addition to these four groups of users, this author and the various co-researchers were participant observers, ourselves using the technologies studied. We also observed people's photographic practices "in the wild," in public places, in online sites (notably Flickr.com), and among our own social networks.

Finally, we draw on numerous less formal "interviews" and interactions. For example, on a recent plane trip I told a stranger that I am interested in photography (without describing this research). He pulled out his laptop to show me his photos.

3.2. *Methods*

Our methods with all four groups, dictated by our theoretical approach, were qualitative and ethnographically-informed. Our method is similar to that used by Okabe and

Ito (2006). Okabe and Ito combined naturalistic observation of cameraphone users' activity with interviews in which participants and researchers interpreted the images and patterns of activity. Our studies were variably naturalistic and interventionist: We studied some people who were already using the focal technologies on their own, and some to whom we gave the technologies, allowing them to use (or not use) the technologies as they wished for a long enough period that their activity (including non-use) was likely to have stabilized. (From the MMM2 users, we judged that this took about eight weeks.) We also viewed and discussed their images and traces of their activity over time with them, to elicit their understandings of the meaning of the data.

In all four studies we used virtually the same protocol for semi-structured interviews. We asked about their past and present photographic practices in general, with all cameras; differences in their images and practices with different kinds of cameras; and about cameraphones, MMM2, Flickr, and Zonetag, as appropriate. We also asked about their image-viewing, such as of friends' images on Flickr.

Each participant was interviewed at least once and up to three times, in their homes if possible, or in our facilities. We interviewed the first group, the "ordinary" photographers, in their homes, and asked them to show us their photos: displayed on walls, collected in albums, and tossed into boxes and drawers, as well as digital files on their computers. The second and third groups, MMM2 and Flickr users, were interviewed in our location, where we looked at their online images with them. Members of the fourth group were interviewed three times, when possible: at the beginning, middle, and end of the study (Ames et al., 2009). The first and second interviews were sometimes with one person and sometimes in groups of friends/participants, at someone's home or workplace. The third interviews were single-person interviews either in their location or ours.

Most interviews included a photo elicitation component (Harper, 2002; Van House, 2006a, 2006b) in which we viewed interviewees' images with them and asked about specific images: for each, what was its subject or significance, why they took, posted online, and/or shared it; who was the intended audience; how the audience responded; and so forth. For MMM2 and Flickr users, the technology made it easy to view a large number of their digital images with them. For MMM2 users, we developed a visualization that showed large numbers of thumbnails chronologically (Fig. 2). This revealed patterns of image-making over time and grounded participants' responses in evidence of their activity.

For the Flickr users (that is, the third and fourth groups), we viewed their public online photos before interviews and periodically throughout the study.

4. Findings

First we talk about image-making generally; then we organize our empirical observations by the medium of

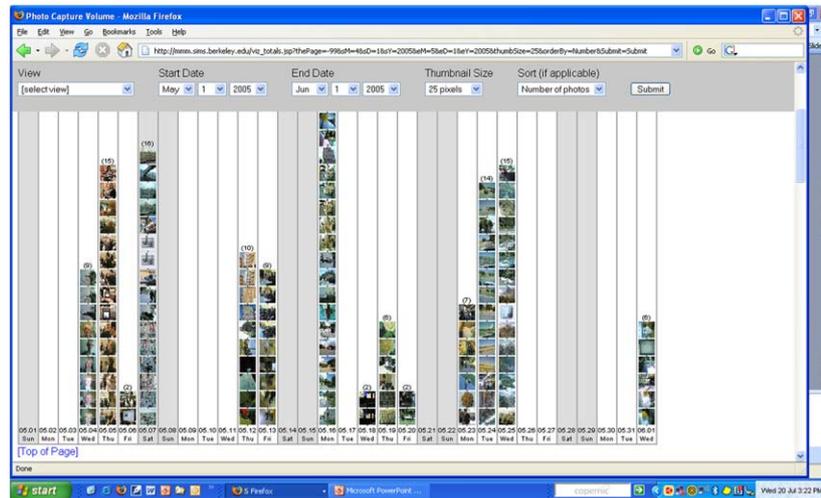


Fig. 2. Visualization of images capture over time.

sharing with an emphasis on collocated viewing and the changes associated with digital technologies.

4.1. Images and collections

Almost all film photos begin their social lives as prints. (Only our most serious photographers had ever made slides, and only one still worked in transparencies.) Digital photos are printed much less often.

Much collocated sharing of prints is informal, with the prints passed around or even left lying around for friends to look at and ask about if they wish. A more organized way to store and present prints is the photo album. The physical form of the album makes it easy to pull out and look at alone or with others. The traditional album sequences photos, often with annotations for the individual prints and/or groups. Meaning is constructed in part by the sequencing.

Walker and Moulton (1989) examined more than paper 40 albums created by non-professional photographers. Most albums, they argue, are constructed on the basis of some sort of narrative. Some people told us that they would take or keep otherwise-undistinguished images to fill out a narrative (Fig. 3). But Walker and Moulton concluded that the album on its own is generally insufficient for the viewer to make sense of the images and the narrative. Albums, they conclude, are intended to be presented to a few people at a time, with an accompanying oral narrative.

In our home-visit interviews, we saw many photo albums. However, people consistently apologized for their disorganization and claimed they planned to better annotate and arrange their images – someday. Their strong expectations about *our* expectations indicate a shared value of selected, edited, labeled, and ordered images. But this was a rarely-attained ideal. Our participants and others tend to resist labeling print photos, as shown in earlier research (e.g., Rodden and Wood, 2003). Even our most avid album-makers had a backlog. Our people generally



Fig. 3. Photo likely taken to fill out a narrative: in this case, likely to indicate location of a sequence of images.

saw little need for metadata beyond date of capture. An 80-something-year-old woman and her daughter claimed that captions were not needed because the mother knew everyone in the images.

Our participants did even less to label or organize digital photos stored locally. They were quickly overwhelmed by the size of their collections and the opacity of computer-based storage, with indecipherable filenames.

Flickr users can add tags, or keywords, to uploaded images. Most of our users did not tag at all. For themselves, it was unnecessary for retrieval. They said date was enough. Flickr images are sequenced by date of upload, and, like our print photographers, Flickr users said this was enough. One parent noted that all her photos would be tagged the same, with her family members' names, so tags would be useless. Those who tagged generally did so for other Flickr users—basically, for strangers, as a sort of civic duty. This bifurcation of Flickr users reflected that found by Miller and Edwards (2007).

When we asked interviewees if they would be interested attaching voice recordings to images – by which we meant voice annotation of images or voiceovers (Frohlich, 2004) – they uniformly wanted the voice of the person in the image, especially children or deceased loved ones.

Paper and books have material qualities hard to match in the digital world. An interesting development in the realm of digital imaging is the self-published photographic book. Two of our participants had used such a service for photos from trips. Unlike traditional albums, these can be easily printed in as many copies as desired. With Blurb.com, for example, the creator can share the URL and others can order copies.

4.2. Slide shows and digital story-telling

Another traditional form of collocated photo viewing is the slide show: sequenced images, often of an event or a trip, presented in a darkened room, with commentary by the owner/photographer. None of our subjects were still working in 35-millimeter film-based slides, but slide shows are easily created with digital images.

Some of our respondents said flat-out that people do not have the time for collective viewing events like slide shows: “Inviting them over, pouring some tea, and seeing pictures just isn’t something that people do anymore.” However, two of our respondents in their 20s did engage in digital slide shows. Each had an LCD projector in their home: not a common household device.

We’ll go to Napa [and take pictures], come back to the house, I’ll load up the pictures on my projector and we’ll look through them that night and socialize, comment.... Sometimes if we run out we’ll look at older ones...like, “Remember Halloween last year?”

What’s notable about this quote is that he reports viewing past events only secondarily; the primary images are those of a just-completed event.

Another version of the digital slide show is a continuous display of digital images on a laptop or a larger screen, usually adjunct to a social event. We saw two at memorial events, displaying images from the life of the deceased; we heard about them being shown at bar/bat mitzvahs. People view the images at will, mixed with conversation and other activity. Any accompanying narrative is informal and episodic. The role of the owner/presenter is much diminished from the traditional slide show. But we saw spontaneous conversations among attendees around the images.

An important current trend is what’s called *digital story-telling* (Hartley and McWilliam, 2009): a digital sequence of still images (and sometimes film clips) accompanied by a soundtrack of music and/or narrative. One participant said he liked making these because he could “show people what I am thinking and feeling.” Some of these narratives exist online; some are created locally and distributed on DVDs. Some are produced by professionals. More often, these are

self-produced. A variety of training organizations help people learn how to do this. For example, the Center for Digital Story-telling in Berkeley (<http://www.storycenter.org/>) provides training and encourages the practice of digital story-telling. Consumer applications designed for just this purpose are emerging, such as MemoryMiner™ from MemoryMiner.com.

4.3. Print displays

Printed photos are often displayed around homes and workplaces: framed on walls and desktops, informally stuck on refrigerators and cubicle walls. (None of our participants used or expressed any interest in digital picture frames.)

In the workplace, these images often depict the owners’ life outside of work: vacations, sports, pets, and family, especially children (Fig. 4). These are intended, to varying degrees, for both the owner and for co-workers and visitors. They may be occasions for conversation. Or they may communicate information about the owner indirectly. One of our interviewees expressed (somewhat humorously) being affronted by the absence of a picture of herself in her husband’s workspace. How would anyone know he was married? she asked.

We found and were told about a variety of photos displayed in disparate places in the homes we visited (Fig. 5), including not just family but friends, pets, landscapes, travel photos, and art photos made by the householders. These images were intended both the household and visitors, with more private photos in the private parts of the home such as bedrooms; and those in the public areas intended for visitors as well as residents. One woman said that the photos displayed in her house were not just of the kids because:

I just don’t want people to think it’s all about the kids, that we have no other interests.



Fig. 4. Work station with personal photos.



Fig. 5. Refrigerator with photos.

Another woman displayed photos of herself, taken by a traveling companion, in the bedroom because she would not put images of herself in the public rooms.

Our respondents also reported varied reasoning and sometimes careful diplomacy determining which photos were displayed where and how in the home, consistent with the findings of Rose (2003) and Taylor et al. (2007). One recurring theme was that the “best” images go on the walls (which leaves open the question of what makes an image “best”). One woman changed her displays to fit the season. In a merged household, the wife was careful to display photos of her children and his equally.

We were told that photo displays of all kinds were for memory, but also passive invitations to examination and conversation. One woman said of a small picture she had taken of a whale, displayed prominently in her living room: “*It’s a great conversation piece.*” In one household, we commented on a photo of two young men, one in a cap and gown. This occasioned the telling of what was clearly a much-loved family story: the father told the story of the about the two young men, their relationship, and their respective academic accomplishments.

We also saw a displays of prints, similar to the digital slideshows described above, at a memorial service for a 91-year-old neighbor. Friends and family mingle in front of a large display of pictures from his entire lifespan. His wife

said that she had put together the display to show friends and family who he had been over the years, especially before the years of his aging and illness.

4.4. Viewing on the computer screen

Digital photos and computers go together. However, for collocated image-viewing, not all computers are equal. We found (as did by Frohlich et al., 2002) that the computer was not always a comfortable viewing site. Sometimes this was about screen size, and the difficulty of crowding a group around a small computer screen. Other times it was about location. People with desktop home computers in a back room cited the location and fixedness of the computer as a barrier. One explained that pictures are “supposed” to be viewed “in the living room, in front of the fire.”

In contrast, we visited a household with the computer in the dining room, the center of the house physically and socially. A running slideshow was often used to entertain the children, who liked viewing images of themselves (and YouTube videos).

Most of our participants used laptops and carried them much of the time, and the majority of our respondents’ collocated digital image sharing was on laptops. Laptops enable spontaneous viewing and showing. Their pictures were almost always with them. As we have noted, on a recent plane trip, this researcher told her seatmate that she was interested in photography. Her companion, a stranger, pulled out his laptop to display and tell stories around aesthetic and travel photos taken by a friend; pictures and short videos of his 1-year-old daughter who lived hundreds of miles away, emailed by her mother; and photos of a family wedding. (Interestingly, he had only taken a few of the images himself.)

4.5. Viewing on the capture device

Another screen for viewing images is on the camera. One of the most welcome characteristics of the digital camera is the ability to view an image immediately after capture. Photographers appreciate the instant feedback. The camera screen is also a site of collocated viewing, especially when there is no computer at hand, such as during travel.

We have noticed, and our participants confirmed, that a common practice with digital cameras is to show an image to companions directly after capture. In particular, the subject can review his or her image immediately and pass judgment on whether they want it deleted (Fig. 6). Interviewees were uniformly sensitive to subjects’ preferences about how they were represented, when making images and especially when posting them online.

Cameraphones are often used as image-viewing devices. A cameraphone can carry many more images than a person is likely to carry as prints. Cameraphones were used as “photo wallets” to carry images of significant others, children, pets, and travel for the owner’s pleasure and for



Fig. 6. Subject views photo, and photo is re-taken.

showing others. One participant carried some photos of his trip to Hong Kong on his laptop and others on his cameraphone, for sharing with others.

As noted above, the images made with cameraphones are often informal and transitory. Some people did not bother uploading these images, using the cameraphone for viewing and sharing. One young man said:

I tend to show people [photos on the phone] more... I'll have coffee with someone and I'll know I took a funny picture of them or a funny video of them.

Several people spoke of viewing and sharing images on the cameraphone as something to fill in downtime, or when bored—similar to the findings of Naaman et al. (2008).

A graduate student who lived two hours from campus described taking pictures of friends and what she saw during the day to show her husband that evening:

... we were telling one another about our day, a way to illustrate my day... This is what I saw during the day... This is my friend, the one I always tell you about.

The low quality of cameraphone screens were often cited as a barrier to both photographer feedback and co-present viewing. Over the period covered by these studies, camera-phone image and screen quality improved substantially. The iPhone was introduced near the end of the Zonetag study, and two participants who acquired them were enthusiastic about its larger screen for viewing images, even though the iPhone camera quality was inferior to the cameraphones they had been using.

4.6. Online images: one's own and others

Digital images are often posted on blogs, personal and family websites, dedicated image-sharing sites like Flickr.com and KodakGallery.com, and social networking sites like Facebook.com and MySpace.com. Internet sites make images available from anywhere there is an Internet connection. (Our participants who used multiple sites had clear guidelines for themselves as to which images they put on which site, based on the expected audiences.)

People who had used both MMM2, in which individual images were emailed to recipients, and Flickr, where viewers log on to view at their own pace, much preferred the “pull” nature of Flickr to the “push” nature of

MMM2. Photo owners were sensitive to overwhelming viewers/recipients with too many photos or making excess demands on their time.

These sites are also used for collocated sharing. For example, one woman reported that when her mother came to visit from a nearby town, they looked online together at the daughter's photos from a recent wedding and a trip.

One respondent, asked about whether he ever engaged in collocated sharing, answered:

Yes. And usually it's again stuff other people might have taken pictures of or I shot, either sitting in Picasa [a computer-based photo organizing application, or Flickr [flickr.com]]. It can be on my laptop or it could be on someone else's. I had a cousin who's in town who didn't see some pictures of my brother when he went skiing recently, and one of my friends went with him and took a bunch of pictures, so—we were on his laptop so I was able to just quickly go to my friend's [online] photo site...

Two things are notable about this comment. Images on a publicly-accessible online photo site could be viewed from anywhere; and the images could be his own or others'. Public sites like Flickr.com make images available wherever there is an Internet connection, for easy and spontaneous co-present viewing as well as solitary viewing. These can be one's own images, or other people's. A common practice on Flickr is for the photographers at an event to use a common “tag” or keyword, such as CHI2008 for a conference or SteveandAnnWedding. All the images can be pooled for a better photo record. This sharing does not necessary have to be coordinated, as long as photographers tag their images so that they can be found. As one person said:

I don't take photos any more of big events. When I was at Burning Man I didn't take a camera, because I knew there'd be enough photos on Flickr of really anything I might have.

4.7. Digital technology, photography, and collocated sharing

In sum, personal photos and various forms of collocated sharing were important to our participants. What is hard to convey in a summary of findings is the emotional valence of

photos and photo-sharing that came through in our interviews and other interactions.

The practice of *digital* personal photography is both consistent with and different from prior photographic practices. Personal photography as an important element of daily life, memory, relationships, and identity has been remarkably successful, and its practitioners have been resourceful in adapting new technology to enduring practices as well as in exploiting its new possibilities.

Collocated sharing remains important in a technologically-mediated, distributed, digital world (Crabtree et al., 2004; Frohlich et al., 2002; Kindberg et al., 2005). Moreover, new image-related technologies are being adapted to collocated sharing. Face-to-face sharing uses online image sites, digital slide shows, and a multitude of image devices, including cameras and smartphones, laptops and desktop computers. Digital story-telling technologies and digitally-produced photo books can be used for both distant and co-present story-telling.

Three aspects of digital image-making and sharing technologies are especially significant for emergent collocated viewing practices: changing content; increased availability; and changing distinctions between public and private.

First, people make more images with digital imaging technologies. With cameraphones and small digital cameras that are easy to keep at hand, in particular, they more mundane images of daily life, unexpected sights, and humor.

Second, digital images are more available than print. They by-pass the delays of film processing. They can be viewed and shared sooner after capture and more easily via a wide range of mechanisms. They are portable: easily carried in large numbers on laptops, cameraphones, and other handheld devices. Online images are accessible from wherever there is an appropriate networked device, such as a computer or a smartphone. The result is that wide selections of images are readily at hand for spontaneous co-present viewing.

Third, in the digital world, the boundaries between public and private, mine and yours, are increasingly malleable. Digital images easily emailed and downloaded. Like the man I met on the plane, people's collections are not limited to images they've made themselves. Finally, sites like Flickr allow users to view, download, combine, and re-use images from multiple photographers: friends, family, distant acquaintances, co-workers, and strangers. Co-present sharing and story-telling can draw on a wide variety of images.

5. Discussion: collocated sharing

In keeping with our emphasis on user-constructed meanings and goals, in this part of the paper we discuss some possible reasons for the importance of collocated sharing and its continuing popularity, and how it may tie into people's enduring, on-going, practices and goals.

5.1. Memory, story-telling, and identity

Personal photos are valued for both personal and collective memory and identity, and autobiographical narratives. Although contemporary thought stresses the constructedness and contingency of both memory and photos, the popular view is that photos "capture the moment." Many participants described off-loading memory to images, to ensure that something was remembered later. Photographs may also reveal things we did not see at time. A participant showed us a picture of herself taken a few months before a major health crisis. She pointed out that she already looked ill in the photo, but did not yet know it. Her self-narrative, which included her illness, changed when she realized she had been ill earlier than she thought.

Memories and the narratives by which we make sense of them play a major role in how we construct our self-narrative and self-understanding. These stories and our understandings of ourselves are dynamic. This process is both individual and collective:

Even our own homely accounts of happenings in our own lives are eventually converted into more or less coherent autobiographies centered around a Self acting more or less purposefully in a social world. Families similarly create a corpus of connected and shared tales...Institutions, too...'invent' traditions out of previously ordinary happenings and then endow them with privileged status (Bruner, 1991, p. 18).

Personal photos are frequently the anchors for story-telling (Balabanovic et al., 2000; Chalfen, 1987; Crabtree et al., 2004; Frohlich et al., 2002; Frohlich, 2004; Lehtimki and Rajanti, 2008). The story also may change over time, as the owner's own interpretation of the image is revised. Linde (1993) notes that we often re-interpret our own history such that events that may have been unremarkable at the time take on new meaning. Individuals, families, and other social groups develop a corpus of connected, shared tales that are told and retold that help to construct the individual's self-image, and the group as a group. Telling our stories to others is an occasion to make sense of our lives for ourselves. This may be one reason people enjoy showing their images and telling their stories to others (Frohlich et al., 2002), which was apparent to us as participants showed us their images.

5.2. Relationships

Personal photos both in their content and what is done with them, have long been important to relationships. They are viewed collectively and individually, given as gifts, displayed on walls, and collected in albums. The activity of shared viewing of images itself is important to the construction and maintenance of relationships – we *enact* as well as represent relationships by means of images.

I argue that the *experience* of sharing images and stories, especially face-to-face, enacts the relationships between owner and viewer (as well as between viewers and people depicted). Linde (1993) notes a correlation between the stories we tell and the kind of relationship we have with another. We expect, for example, to know certain things about friends' lives; we would be affronted if a close friend did not tell us about a major life change, such as marriage or a job change. Similarly, she says, sharing such stories helps to bring us closer to one another. So too is the act of co-present viewing and conversation around photos and how we share our lives.

One form of shared synchronous viewing is reminiscing. People who were present when the images were made re-live and comment on their shared past, re-enforcing past relationship-building experiences, and (re)enacting their relationship in the present moment.

Another form of story-telling around images is for people who were not part of the picture-making, especially people who are part of the group but were not present for the events depicted. Our MMM2 participants often sent pictures to people whom they said “should” have been present but were not: members of the social group. One woman wanted her American nephews to understand that they were part of a large family with many members still living in Europe, where the family had a long and rich history. She showed the boys family pictures and told them stories of the people and events depicted.

Many current social theoretic accounts of family photography emphasize the construction of the family by means of photos: images of the happy family doing what happy families are supposed to do (Bourdieu, 1996; Spence and Holland, 1991; Slater, 1995; Rose, 2003). These images are predictable and banal (Rose, 2003, 2004), I argue, for good reason: we know what family photos are supposed to consist of, and look like; we know what families are supposed to do and look like. Theorists such as Slater (1995) argue that these images are not so much reflecting as constructing the family according to the expectations of their social group.

Similarly for other social groups: images and the stories told serve to define the nature and boundaries of the group, identify its members, and both reinforce and enact the group's cohesion and self-concept, and communicate that to newcomers and outsiders.

Because images may be crucially involved in relationships, who sees which images and hears which stories can be a highly fraught decision. Ahern et al. (2007) noted that social disclosure was a theme in Flickr/Zonetag users' privacy concerns. A recurring request in our Flickr interviews was for more flexible control over who sees which images on the site.

5.3. *Orality*

Oral story-telling is a key element of collocated sharing image-sharing (e.g., Balabanovic et al., 2000; Chalfen,

1987; Frohlich and Fennell, 2007; Musello, 1980). Chalfen (1987) notes that the narrative represented by photos generally “remains in the heads of the...participants for verbal telling and re-telling during exhibition events” (p. 70). Walker and Moulton (1989) conclude that the typical photo album assumes an accompanying oral narrative. Musello (1980) concludes:

[The personal photo] seems heavily reliant on verbal accompaniment for the transmission of personal significances. Photographs presented to others are typically embedded in a verbal context delineating what should be attended to and what significances are located in the image, and providing contextual data necessary for understanding them (Musello, 1980, p. 39).

If memories and narratives are dynamic and situated, then co-present viewing supports improvised, situated narratives. This may also help explain why people are often reluctant to annotate images, to fix their meanings. Captions, annotations, and juxtaposition (or sequencing) all help to constrain the images' meanings. But oral story-telling gives dynamic control over the story told in the moment. Ong (1982) describes oral story-telling as an interaction between the performer and live audience, shaped by the intentions of the storyteller with regard to a specific audience and the interests of the audience. Face-to-face photo sharing is a conversation between the presenter and viewers, enabling the presenter to customize the narrative for the current conditions and the audience using words and gestures and to convey emotions and other information non-verbally as well as verbally.

5.4. *Performance*

Our last topic, performance, in way subsumes and illuminates memory and identity, relationships, and orality. The “performative turn” in the social sciences of the last decade or two emphasizes the way that people create and recreate social reality through performance. Two different approaches to performance are frequently cited (see Gregson and Rose, 2000). One is rooted in the work of Erving Goffman (1955); the other in that of Judith Butler (1990). Both approaches are relevant to our understanding of images and image-sharing.

Goffman described the interaction between an existing, conscious self and the world, whereas Butler theorized an on-going enactment of self. Goffman's approach to performance is concerned with managing how the world sees us, how we present ourselves to the world. HCI research citing Goffman seeks to understand the role of impression management when people share information about themselves online. For example, Volda and Mynatt (2005) use Goffman to help explain how, when a work group shared their iTunes downloads, members expressed concern about what others would think about them based on their musical preferences.

Photographic self-representations include, of course, portraits and self-portraits; as well as images of family and friends; pets; activities; travel; personal spaces, such as homes; and belongings. Expressive images such as art photography and humor can also be seen as forms of self-representation.

Judith Butler is concerned with the *enactment* of the self. Unlike Goffman, Butler does not begin by assuming the existence of a social agent. Instead, she is concerned with its discursive construction. Butler's agent is often acting without awareness, which is one reason that this performance often reproduces power relations. *Performativity*, a key term for Butler, highlights the repetitive, *citational* (a key term for Butler) aspect of performance. People act in the way that they have learned to act, in accord with the dominant discourse. Her primary topic is gender, but her approach has been used to explain how people enact other social categories, such as space (Gregson and Rose, 2000).

In Butler's sense, I argue, images are part of how people perform, enact or construct themselves, individually and collectively. Part of the predictability of family photos is their citational nature: we know what families are supposed to do and look like and how family photos are supposed to depict them. Haldrup and Larsen (2003) and Larsen (2005) root their analysis of tourist photography in Butler.

Photographing is about producing rather than consuming geographies and identities...Tourist places are produced places, and tourists are coproducers of such places (Larsen, 2005, p. 422).

I argue that, in the process of doing what we do (including in front of a camera), as well as explicitly creating images (of ourselves, or of other subjects) and telling stories (including those around images, for ourselves and for others) we enact ourselves, individually and collectively.

In image-making and narrative – especially collocated – both kinds of performance are relevant, self-(re)presentation *a la* Goffman, and enactment *a la* Butler. In Goffman's terms, people manage the impressions that they convey to each audience by means of images and the narratives around them. For example, our participants who used multiple image-posting sites, such as Flickr and Facebook, decided which images went where based on expected audience. In Butlerian terms, the subject is enacted in the activities depicted in the photos; in the making of the images; and in the sharing and story-telling.

The concept of performance, in either of these approaches, helps us to understand the importance of collocated image viewing. It is done in real time. It is specific to current conditions. The images viewed and the narrative can be adjusted on the fly. It can be tailored to the audience and conditions. It is performative in the abstract, and literally.

6. Implications

Personal photography and collocated photo sharing are likely to remain important in people's daily lives. Personal photos are deeply implicated in memory, identity, and relationships. The synchronous, situated narrative constructed in the moment, in conjunction with the audience, is an important social practice by which images, audience, and subject come together for both individual and group self-understanding and relationships. Performance of the individual and the group—in both Goffman's and Butler's terms—remains an important social activity. While face-to-face interaction is not the only way we achieve these ends, it remains important.

As digital technologies make image-making and sharing easier, more people are likely to engage in more varied photographic practices. This will include people both with and without skills in photography and other media, computers, and story-telling.

While the purpose of the paper is to describe practice, not to offer suggestions for technology design (Dourish, 2006), some suggestions do emerge from this analysis. These are not necessarily radically new; rather, our analysis reinforces the importance of some current trends as well as suggesting some new directions.

First and most obviously, it is important to support and, if possible, improve upon co-present sharing, including oral story-telling when appropriate. One way to do this is with improved access to content. A frequent desire of our participants was easier integration of their own images, such as from multiple digital cameras and online sites, and older prints. Some of our interviewees used Flickr as a single repository for all their digital images. However, many wished that it were easier to upload large quantities of images to Flickr. Plus, of course, paper images and slides needed scanning and input.

Better content management is also needed. Various technological solutions are being attempted to automate the assignment of metadata.

Multimodal story-telling requires flexibility in drawing on, combining, linking, and sequencing media of many kinds from many sources, and not just the story-teller's own content, including video, sound, maps, and other media (and dealing with copyright). This is not just a technical issue. For example, many museums and archives are now putting their content on Flickr and encouraging its re-use. This trend is encouraging.

Next, improved technological support for co-present sharing might include improved devices, such as portable digital viewing devices—special purpose devices or, more likely, functionality added to convergent devices like smartphones, laptops, netbooks, and the like. Screen size and resolution, browsability, and support in recombining and re-ordering multimodal content would all be welcome.

Given that oral commentary and stories are frequently re-constituted for different audiences and changing circumstance, it would help if content could be easily remixed

on the fly—just as story-telling is often improvisational and non-linear.

Forms of distant sharing closely aligned with co-present practices are likely to be well-received, such as synchronous distant viewing of photos that allows conversation among participants. One woman told us that she and a relative would view photos online while talking about them on the phone. Some MMM2 users inserted URLs into online chats, combining text and images in real-time interaction. Volda and Mynatt (2005) report on a similar application using webcams.

The digital story-telling movement is, supporting in essence, distant asynchronous viewing with a verbal and/or musical soundtrack. These static multimodal narratives lack the interaction and improvisation of collocated viewing. But they can instantiate narratives, “capturing” the current expressions of their makers. Perhaps they could be less static: allowing, for example, multiple versions of, say, a travel narrative for intimates versus one for more distant friends and co-workers, or of a family history for family members versus people interested in local history.

Some of these technologies currently exist in some form, and some do not. The point here is that our research indicates that these kinds of developments would be welcome.

Finally, some comments on research methods. First, this study reinforces the need for attention to people’s actual practices and understandings, to see how they interpret and perform new technologies. Research also needs to allow for the variety of possible activities and appropriations people may make with new technologies. If the interpretation and domestication of a technology is culturally and historically situated, and many local variations are possible, then studies of a handful of users, as often happens in HCI, need to be treated with care.

Similarly, interventionist studies of new HCI technologies are often of necessity relatively short-term. But the research needs to run long enough, if possible, for people’s natural practices and understandings to emerge, for people to incorporate the technology into their on-going activities, and for some to improvise new activities, and for some to such as the users who embedded MMM2 URLs in their instant messaging. In the MMM2 study, use patterns seemed to stabilize after about eight weeks. This length of time is not necessarily universally applicable, but it does indicate that shorter studies can be problematic.

Personal photography is highly valued as an important part of people’s lives, including their memories, construction of self, and relationships; their self-narratives; and their performance of identity. Emerging technologies and new media that align with people’s enduring practices and goals and enable new social practices around photos can enhance an important part of people’s technologically-mediated lives.

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References

- Ahern, S., Eckles, D., Good, N., King, S., Naaman, M., Nair, R., 2007. Over-exposed?: privacy patterns and considerations in online and mobile photo sharing. In: *Proceedings of CHI '07*. ACM Press, New York, pp. 357–366.
- Ames, M., Eckles, D., Naaman, M., Spasojevic, M., Van House, N., 2009. Requirements for mobile photoware. *Personal and Ubiquitous Computing*. doi:10.1007/s00779-009-0237-4.
- Ames, M., Naaman, M., 2007. Why we tag: motivations for annotation in mobile and online media. In: *Proceedings of CHI '07*. ACM Press, New York, pp. 971–980.
- Apted, K., Kay, J., Quigley, A., 2006. Tabletop sharing of digital photographs for the elderly. In: *Proceedings of CHI '06*. ACM Press, New York, pp. 781–790.
- Balabanovic, M., Chu, L.L., Wolff, G.J., 2000. Storytelling with digital photograph. In: *Proceedings of CHI 2000*. ACM Press, New York, pp. 564–571.
- Bouquet, M., 2000. The family photographic condition. *Visual Anthropology Review* 16, 2–19.
- Bourdieu, P., 1996. *Photography: A Middle-Brow Art*. Stanford University Press, Palo Alto, CA.
- Bourdieu, P., Bourdieu, M.C., 2004. The peasant and photography. *Ethnography* 5, 601–616.
- Bruner, J., 1991. The narrative construction of reality. *Critical Inquiry* 18, 1–21.
- Butler, J., 1990. *Gender Trouble: Feminism and the Subversion of Identity*. Routledge, New York.
- Camera and Imaging Products Association, 2009. 2009–2011 Outlook on the Shipment Forecast by Product-Type Concerning Cameras and Related Goods (Press Release), www.cipa.jp/english/pdf/press090127_e.pdf. Date accessed: 20 May 2009.
- Chalfen, R., 1987. *Snapshot Versions of Life*. Bowling Green State University Popular Press, Bowling Green, OH.
- Chalfen, R., 1998. Interpreting family photography as pictorial communication. In: Prosser, J. (Ed.), *Image-Based Research: A Sourcebook for Qualitative Researchers*. Falmer Press, London, pp. 214–234.
- Clawson, J., Volda, A., Patel, N., Lyons, K., 2008. Mobiphos: a collocated-synchronous mobile photo sharing application. In: *MobihCI '08*. ACM Press, New York.
- Counts, S., Fellheimer, E., 2004. Supporting social presence through lightweight photo sharing on and off the desktop. In: *Proceedings of CHI '04*. ACM Press, New York, pp. 599–606.
- Crabtree, A., Rodden, T., Mariani, J., 2004. Collaborating around collections: informing the continued development of photoware. In: *Proceedings of CSCW '04*. ACM Press, New York, pp. 396–405.
- Davis, M., Van House, N.A., Burgener, C., Perkel, D., King, S., Towle, J., Ahern, S., Finn, M., Viswanathan, V., Rothenberg, M., 2005. Mmm2: mobile media metadata for media sharing. In: *CHI '05 Extended Abstract*. ACM Press, New York, pp. 1335–1338.
- Dijk, J.v., 2007. *Mediated Memories in the Digital Age*. Stanford University Press, Stanford, CA.
- Dourish, P., 2006. Implications for design. In: *Proceedings of CHI '06*. ACM Press, New York, pp. 541–550.
- Frohlich, D., Kuchinsky, A., Perring, C., Don, A., Ariss, S., 2002. Requirements for photoware. In: *Proceedings of CSCW '02*. ACM Press, New York, pp. 166–175.
- Frohlich, D.M., 2004. *Audiophotography: Bringing Photos to Life with Sounds*. Springer.
- Frohlich, D., Fennell, J., 2007. Sound, paper and memorabilia: resources for a simpler digital photography. *Personal and Ubiquitous Computing* 11, 107–116.

- Goffman, E., 1955. *The Presentation of Self in Everyday Life*. Doubleday, Garden City, New York.
- Gregson, N., Rose, G., 2000. Taking butler elsewhere: performativities, spatialities and subjectivities. *Environment and Planning D—Society & Space* 18, 433–453.
- Haldrup, M., Larsen, J., 2003. The family gaze. *Tourist Studies* 3, 23–45.
- Harper, D., 2002. Talking about pictures: a case for photo elicitation. *Visual Studies* 17, 13–26.
- Hartley, J., McWilliam, K., 2009. *Story Circle: Digital Storytelling around the World*. Wiley-Blackwell, Hoboken, NJ.
- Hjorth, L., 2007. Snapshots of almost contact: the rise of camera phone practices and a case study in Seoul, Korea. *Continuum: Journal of Media & Cultural Studies* 21, 227–238.
- Holland, P., 1991. Introduction: history, memory, and the family album. In: Spence, J., Holland, P. (Eds.), *Family Snaps: The Meaning of Domestic Photography*. Virago, London, pp. 1–14.
- Holland, P., 1997. “Sweet It Is to Scan...”: personal photographs and popular photography. In: Wells, L. (Ed.), *Photography: A Critical Introduction*. Routledge, London, pp. 105–147.
- Kindberg, T., Spasojevic, M., Fleck, R., Sellen, A., 2005. The ubiquitous camer: an in-depth study of camera phone use. *Pervasive Computing* 4, 42–50.
- Koskinen, I., Kurvinen, E., Lehtonen, T.-K., 2002. *Mobile Image*. IT Press, Helsinki.
- Larsen, J., 2005. Families seen sightseeing: performativity of tourist photography. *Space and Culture* 8, 416–434.
- Law, J., 2001. Notes on the Theory of the Actor Network: Ordering, Strategy, and Heterogeneity, <http://www.lancs.ac.uk/fass/sociology/papers/law-notes-on-ant.pdf>. Date accessed: 31 July 2009.
- Lehtimäki, K., Rajanti, T., 2008. Documenting the ordinary: mobile digital photography as an agent of change in people’s practices concerning storing and sharing of photography. In: *Proceedings of NordicCHI ’08*. ACM Press, New York.
- Linde, C., 1993. *Life Stories: The Creation of Coherence*. Oxford University Press, New York.
- M:Metrics, 2006. M:Metrics Press Release: M:Metrics: Captured by Camera Phones: Photo Messaging Climbs as Camera Phones Snap up Market Share.
- Miller, A.D., Edwards, W.K., 2007. Give and take: a study of consumer photo-sharing culture and practice. In: *Proceedings of CHI ’07*. ACM Press, New York, pp. 347–356.
- Mislove, A., Koppula, H.S., Gummadi, K.P., Druschel, P., Bhattacharjee, B., 2008. Growth of the flickr social network. In: *Proceedings of the First Workshop on Online Social Networks*. ACM, Seattle, WA, USA, pp. 25–30.
- Musello, C., 1980. Studying the home mode: an exploration of family photography and visual communication. *Studies in Visual Communication* 6, 23–42.
- Mynatt, E., Rowan, J., Craighill, S., Jacobs, A., 2001. Digital family portraits: supporting peace of mind for extended family members. In: *Proceedings of CHI ’01*. ACM Press, New York, pp. 333–340.
- Naaman, M., Nair, R., Kaplun, V., 2008. Photos on the go: a mobile application case study. In: *Proceedings of CHI ’08*. ACM Press, New York, pp. 1739–1748.
- Okabe, D., Ito, M., 2006. Everyday contexts of camera phone use: steps toward technosocial ethnographic frameworks. In: Hiflich, J.R., Hartmann, M. (Eds.), *Mobile Communication in Everyday Life: Ethnographic Views, Observations, and Reflections*. Frank & Timme, Berlin, pp. 79–102.
- Ong, W.J., 1982. *Orality and Literacy: The Technologizing of the Word*. Methuen, London.
- Pauwels, L., 2008. A private visual practice going public? Social functions and sociological research opportunities of web-based family photography. *Visual Studies* 23, 34–49.
- Rodden, K., Wood, K.R., 2003. How do people manage their digital photographs. In: *Proceedings of CHI ’03*. ACM Press, New York, pp. 409–416.
- Romero, N., Markopoulos, P., van Baren, J., de Ruyter, B., Ijsselstein, W., Farshchian, B., 2007. Connecting the family with awareness systems. *Personal and Ubiquitous Computing* 11, 299–312.
- Rose, G., 2003. Family photography and domestic spacings: a case study. *Transactions of the Institute of British Geographers* 28, 5–18.
- Rose, G., 2004. ‘Everyone’s Cuddled up and It Just Looks Really Nice’. The emotional geography of some mums and their family photos. *Social and Cultural Geography* 5, 549–564.
- Ruby, J., 2005. The last 20 years of visual anthropology—a critical review. *Visual Studies* 20, 159–170.
- Sarvas, R., Oulasvirta, A., Jacucci, G., 2005. Building social discourse around mobile photos: a systemic perspective. In: *Proceedings of CHI ’07*. ACM Press, New York, pp. 31–38.
- Shove, E., Watson, M., Hand, M., Ingram, J., 2007. Reproducing digital photography. In: Shove, E. (Ed.), *The Design of Everyday Life*. Berg, New York, pp. 69–92.
- Slater, D., 1995. Domestic photography and digital culture. In: Lister, M. (Ed.), *The Photographic Image in Digital Culture*. Routledge, London, pp. 129–146.
- Spence, J., Holland, P., 1991. *Family Snaps: The Meaning of Domestic Photography*. Virago, London.
- Suchman, L., Trigg, R.H., Blomberg, J., 2002. Working artefacts: ethnomethods of the prototype. *The British Journal of Sociology* 53, 163–179.
- Taylor, A.S., Swan, L., Durrant, A., 2007. Designing family photo displays. In: *Proceedings of ECSCW 2007*. Springer, New York, pp. 79–88.
- Van House, N.A., 2006a. Distant Closeness: Cameraphones and Public Image Sharin, http://groups.sims.berkeley.edu/pics/vanhouse_distant_closeness.pdf. Date accessed: 2 July 2009.
- Van House, N.A., 2006b. Interview viz: visualization-assisted photo elicitation. In: *CHI ’06 Extended Abstracts*. ACM Press, New York, pp. 1463–1468.
- Van House, N.A., 2007. Flickr and public image-sharing: distant closeness and photo exhibition. In: *CHI ’07 Extended Abstracts*. ACM Press, New York, pp. 2717–2722.
- Van House, N.A., Davis, M., Ames, M., Finn, M., Viswanathan, V., 2005. The uses of personal networked digital imaging: an empirical study of cameraphone photos and sharing. In: *CHI ’05 Extended Abstracts*. ACM Press, New York, pp. 1853–1856.
- Van House, N.A., Davis, M., Takhteyev, Y., Good, N., Wilhelm, A., Finn, M., 2004. From “What?” To “Why?”: the social uses of personal photos, http://people.ischool.berkeley.edu/~vanhouse/van_house_et_al_2004b.pdf. Date accessed: 1 October 2009.
- Voida, A., Mynatt, E.D., 2005. Six themes of the communicative appropriation of photographic images. In: *Proceedings of CHI ’05*. ACM Press, New York, pp. 171–189.
- Walker, A.L., Moulton, R.K., 1989. Photo albums: images of time and reflections of self. *Qualitative Sociology* 12, 155–183.